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ABSTRACT

To gain insights into what makes student/teacher conversations about writing more and less successful, a sample of freshman composition teachers was asked to tape record all of their writing conferences. In addition, student writing samples were collected. In all, the tape recordings of 48 writing conferences were transcribed and prepared for analysis. Each idea unit was transcribed on a separate line, and conversational turns were marked by an indication of a change in speaker. The topics of conversation were grouped into six clusters: (1) logistics and procedures; (2) general talk and talk about attitudes; (3) oral language, reading, writing relationships; (4) talk about text at the discourse level; (5) talk about text at the level of syntax or mechanics; and (6) talk about cognitive processes. The analysis revealed that, most often, students seemed to direct the differences that occurred in the conference conversations. The female and nonwhite students focused more of their talk on logistics and on the micro levels of the discourse; the male students focused more on the macro levels of discourse. The teachers, on the whole, were very even in their differences in topic focus. They individualized on one variable, cognitive processes and they did not individualize according to ability level, gender, or ethnicity; rather it seemed that they individualized according to student need. (Appendixes include a list of topic codes and clusters of topics, an analysis of topic clusters across conferences, and supplementary papers using conference data.) (HOD)

TEACHING AND LEARNING IN THE INDIVIDUAL WRITING CONFERENCE. FINAL REPORT

Sarah Warshauer Freedman

TEACHING AND LEARNING IN THE INDIVIDUAL WRITING CONFERENCE

FINAL REPORT--NCTE Research Foundation
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Introduction

In this study, I examine in some depth one key event in the teaching of writing: the individual writing conference between teacher and student. I characterize both the conference as a teaching event and the students' learning processes. The conference provides an interesting and convenient setting in which to watch learning occur for two reasons. First, the teaching and learning is concentrated and intense; a lot happens in a little time. Second, since only one teacher and one student participate, it is relatively easy to observe the cognitive processes involved in learning to write, writing development in process. As Shuy (1981) notes, "our ability as teachers to help learners understand specitic problems, limitations, and strategies in writing is hampered by our lack of knowledge about how writing skills develop" (p. 120).

The conference is a key teaching event primarily because it is a place where students receive response to their writing. Theories of oral language learning and intellectual skill development, as well as classroom experience, have led me to conclude that the times when students receive and understand response to their writing are central to the process of acquiring written language. Theories of oral language learning suggest that children acquire oral language by hypothesis testing. "Children use what people say to form hypotheses about how different ideas are expressed in the language they are acquiring....Systematic 'errors' like mans or mouses provide some of the strongest evidence that children learn language, at least in large part, by testing their hypotheses about structure and function and by finding out how well they are understood by others when doing this" (Clark & Clark, 1977, 336-337). As children use particular linguistic forms and functions and then observe the effects on their listeners, they depend on response. If we use similar strategies to learn written language, we need to know how our readers understand and respond to our writing.

Since writing is a more conscious activity than speech, and is largely learned in school rather than at home, it becomes important to examine theories of the acquisition of school-type intellectual skills for additional insight about how writing may be acquired and the role response plays in that acquisition. Diverse theories of intellectual skill development, from Vygotsky's (1978) to Anderson's (1982) point out the central role of response or feedback in the development of intellectual skills. As when acquiring other intellectual skills, learning writers need to distinguish when they are performing well from

when they are not, and they need to know how to take corrective action when their writing is not proceeding well. In other words, they must possess metacognitive skills (Brown, 1981; Flavell, 1981). Further, the notion that writers solve composing problems (Flower & Hayes, 1977; Flower & Hayes, 1980; Hayes & Flower, 1980) grows out of the problem solving literature that was built around how learners solve problems in other domains (Newell & Simon, 1972). This literature too suggests the importance of feedback. Unlike response to speech, in the development of writing as an intellectual skill, the response aims to make the writer conscious of his or her language. Although routines become automatic in writing, just as they do in speaking, when there are composing problems to be solved, a high level of consciousness seems to be demanded.

Therefore, to study how students acquire written language, researchers must examine events that allow the learner to test hypotheses about written language and to practice solving composing problems somewhat consciously. Such events typically involve either real or imagined interaction between the student writer and a reader. Vygotsky (1978) in his theory of learning, notes the importance of such interactions during writing. He asserts, "learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. Once these processes are internalized, they become part of the child's independent developmental achievement" (p. 90). Emig (1981) concludes from developmental research that "the process of writing can be enhanced by working in, and with a group of other writers, perhaps especially a teacher, who give vital response, including advice" (p. 27).

At the early stages of acquisition, children have difficulty imagining a reader and thus depend on the scaffolds provided by an actual responding reader (Vygotsky, 1978; Scardamalia, 1981; Graves, 1982). As children grow older and as their sense of audience develops, they can and do imagine a reader (Kroll, 1978; Flower, 1979). However, throughout the process of learning to write, a real, responding reader plays a central pedagogical role. Just as the listener-speaker interaction is crucial to hypothesis testing when children learn to speak and conscious problem solving is crucial when students develop intellectual skills, the reader-writer interaction is crucial when children learn to write.

Systematic studies of the reader-writer interaction in the conference have begun to emerge during the last decade (Jacobs & Karliner, 1977; Carnicelli, 1980; Reigstad, 1980; Graves, 1983; Freedman & Katz, in press; Freedman & Sperling, in press; Brannon, 1984; Walters, 1984). At the elementary level, Graves emphasizes the importance of "helping children speak" during the conference (p. 97) by arranging the physical setting so that the child does not feel intimidated, by waiting for children to answer questions, by structuring the conference so that its structure will be predictable for the child, by listening to the

child, and by looking for the child's potentials. The teacher must make the conversation cohere from the child's point of view, must ask questions the child can answer, and must help the child focus. Although the child may provide the lead in the conversation, the teacher is responsible for following through in a focused way so that the conversation will be productive for the child. Graves indicates that certain types of teacher questions teach better than others. These are questions that first open up the floor for the student to initiate topics of concern and then questions that follow those topics and that make the child aware of the procedures that he or she needs to follow next. In addition, questions can help the child clarify abstract concepts that underlie writing (Graves gives an example of a child being led to understand the meaning of "information" (p. 112-114)). Finally, Graves points to questions that point the child to solve composing problems outside the conference; such questions begin to remove the scaffolds provided by the conference, and push the child to practice with skills learned during instruction.

Graves (1983) stresses that response in-process must not take ownership of the piece away from the writer; in other words, it should function as a scaffold, not as a new building. Scardamalia and Bereiter (in press) offer a helpful theoretical framework for judging whether a conference helps students reach their potential levels of development. They first suggest that in the teaching of writing, it is important to distinguish between "substantive facilitation," when a teacher responds "to what a student has said or intends to say"--to the content of the writing--and "procedural facilitation" when a teacher responds not to the actual substance of a piece of writing but to the cognitive processes involved in producing that piece. The intent with procedural facilitation is "to enable students to carry out more complex composing processes by themselves" (p. 27). Scardamalia and Bereiter note, "The writing conference could achieve a potentially powerful combination of procedural facilitation . . . and substantive facilitation" (p. 28). However, they stress that facilitation can promote learning only if it leads to a student's "internalization" of what is being taught. Scardamalia and Bereiter elaborate:

> On first thought, conferencing would seem to be well designed for internalization; the thinking, carried out jointly at first, comes in time to be carried out in the mind of the student. But the form of the conference is dialogue, and there is no indication from research to suggest that the mature composing process has the form of an internal dialogue. A more readily internalizable form might be the 'assisted monologue'. . . where the talking is primarily done by the student, with the teacher inserting prompts rather than conversational turns. . . . Serious research is needed to determine what students internalize from what teachers have helped or induced them to do (pp. 28-29).

Although I do not address the question they raise, I examine

the nature of the dialogue in the conference--a first step in addressing such a question. It is important to determine those characteristics of dialogues in the writing conference that might lead students to internalize substance and procedure so that students will independently use effective procedures to produce effective substance.

On a related note, Freedman (1981), at the college level, urges the teacher to listen to the student and allow the conference to function as a two-way interaction rather than a one-way directive from the teacher. Jacobs and Karliner (1977) and Freedman and Katz (in press) note that the conference can grant the student the unusual opportunity to converse with the teacher, in similar ways to everyday, informal conversation. Here language can be used to reinforce for the student what is happening in the classroom and to allow the teacher to see where the student is having difficulty with writing. Walters (1984) notes that conferences can serve three functions for the student: as socialization into interpretive communities, as a literacy event, and as pedagogical conversation.

Through the conference conversation, the teacher has the opportunity to individualize. Freedman (1981) and Freedman and Sperling (in press) note that students let teachers know what their individual concerns are; teachers then either help the students with those concerns or direct them toward new problems to consider and help them learn to seek solutions. Not surprisingly, Freedman and Sperling find that their case study teacher who was selected for her expertise in giving conferences is more successful in helping higher achieving students than in helping lower achieving students. Classroom communication problems common for lower achieving students can easily become magnified in the conference.

Across age levels, individual conferences seem to be designed generally to provide instructional scaffolding during the writing process, from the teacher or sometimes from peers. To date, most research on this type of response has examined how the scaffolding gets built, not how effective it is in the teaching-learning process. The latter research is much needed.

In a study connected to this one (Freedman & Katz, in press) the overall structure of the conference is examined and compared to other diadic conversations, (Labov and Fanshel, 1977; Erickson & Mohatt, 1982; Erickson & Schultz, 1982). I also looked for the the rules, both social and linguistic, that govern behavior during the conference (see also Freedman & Sperling, in press). I have been particularly interested in what the writer is allowed to say as compared to the teacher-reader.

A first step in examining the teaching/learning process is to outline the content of instruction for different types of students and across different types of teachers. Thus, a major aim of this study is to track the topics of conversation in the conference. I want to know how conferences for low achieving

students similar to and different from conferences for high achieving students. To this end, I am interested in how conferences differ across classrooms and across ethnic groups.

I ask the following questions: Do most topics center on issues of knowledge or issues of process or issues of affect? (Note: These categories correspond to those adapted from Halliday's (1973) categories of the ideational, interpersonal, and textual and have been used by Gere (1982) in her study of peer response groups.) In earlier work (Freedman 1981, 1982 and Freedman & Katz, in press) I found that college students have more control over topic during conferences than during classroom lessons. Topic control, along with other characteristics of the discourse, may have consequences for the student's learning.

I wanted to provide a first step in gaining insights into what makes student/teacher conversations about writing more and less successful. Through this research, I hope to be able to begin to point to ways teachers of writing can best support their students' learning process.

Method

Subjects

To participate in this project, I selected four teachers in Berkeley's Subject A composition program and eight teachers in the freshman composition program at San Francisco State University, four experienced tenured or tenure track and four less experienced part-time teachers. All teachers were recommended as among the most outstanding on the staff by their supervisors, and all routinely enjoyed positive evaluations from their students. The part-time teachers, although less experienced, were more up-to-date in current theories of teaching writing, having recently gone through a rigorous three course training program and selection procedure for their teaching position. Further, all were primarily dedicated to the teaching of writing as a profession. The more experienced regular faculty could be characterized most accurately as language or literature scholars who taught writing as part of their required load and who do a good job of it. All of the teachers in the study naturally used frequent individual conferences as part of their regular instructional activities.

Within each teacher's class, eight students were selected to participate. The students represented a range of achievement levels and ethnic groups: four with high verbal scores (as measured by SAT or ACT verbal when available) and four with low scores; within each verbal aptitude group were two Caucasians and two Asian Americans whenever possible.

From this larger sample, I refine the focus on excellence by reducing the sample size to eliminate the least successful cases.

For the data analysis, the plan was to reduce the sample size in half--to leave in the sample the six most successful teachers, according to the judgments of outside experts, (four from San Francisco State and two from Berkeley) and four students from each of their classes. Those students with whom the teacher had most success would remain, but the student sample would remain balanced according to ethnicity and ability level. However, after data were collected the plan was modified because no Berkeley teacher had sufficient data on even four of the eight students. Of the eight instructors from San Francisco State, one of the experienced teachers was ill for the first half of the study and could not participate and another did not collect enough data to be included in the project. The San Francisco State enrollment was more stable and the conferences were given more regularly. Thus, I decided to drop the Berkeley sample, and study conferences from four students in the classes of the four most successful San Francisco State teachers.

Procedures

During spring, 1982, the complete teacher sample (12 teachers) was asked to tape-record all of their writing conferences with eight students in one of their writing classes (96 students). Besides taping the naturally occurring conferences, I collected the writing the students did during the quarter.

To decide which teachers to eliminate from the study, each teacher identified one conference as among his or her most successful. The tape recording of that conference for each teacher was judged by two experts in the teaching of writing who were not familiar with the nature of the research. These experts rank-ordered the conferences according to how successful they felt they were. They also looked at writing that was the basis for the conference and that followed from it. The four teachers judged most successful were identified for the second phase of the study.

According to the original design, I selected four students within the classes of each of the remaining teachers to become the objects of focus. To select these students, I interviewed each teacher about his or her progress with the eight students, examined the student data, and interviewed potential student candidates about their progress in the course and their feelings about the conferences. Subject selection was accomplished in June, 1982.

For each of the 16 students remaining in the study, each teacher in the sample had collected at least four conferences with each student. I decided to study three of these conferences for each student: the first of the semester which served an introductory, get-acquainted function, the second which was about a draft of a student essay, and the last which served to wrap up the semester and discuss the students' progress and leave the

student with important points to consider in future writings. Thus, the entire data set consists of 48 conferences, three per student or twelve per teacher.

During the 1982-1983, the tape recordings of the 48 writing conferences were transcribed and prepared for analysis.

Analysis techniques

First when transcribing the conferences, the research assistants note conversational turns (Sachs, Schegloff, & Jefferson, 1974) and within each turn transcribe the discourse in "idea units" (Chafe, 1980). Staff members check each other's segmentation decisions by periodically independently coding segments of the same talk. Agreement was between 85 to 95% on these decisions.

The research staff used the following transcription conventions for indicating idea units and turns: Each idea unit was transcribed on a separate line. Conversational turns were marked by an indication of a change in speaker. When one speaker interrupted another's turn with a backchannel cue but not with a turn, that talk was placed within slashes where it occurred. The transcription conventions in use can be seen in the transcript on the next page. The guidelines for identifying a turn as opposed to a backchannel cue follow:

Do Not Code as a Turn:

1. Place holders. For example, when one of the participants in the conversation says "uhhuh" while the other participant is talking and this "uhhuh" has no semantic value, rather it just indicates that the participant is attending, then it does not count as a turn.

2. Thinking aloud. When one participant is thinking aloud and is not being expected to respond to the other participant and is not forced in any way to respond to the other participant, this verbalization is not a turn. In these conferences, the student will frequently mumble aloud as she reads her paper over (frequently as a device to avoid taking a turn when she does not know the answer to a teacher question).

3. Non-acknowledged interjections. When one participant interjects a word that the other does not acknowledge (and that participant is not trying to get the floor), this is not a turn.

4. Pauses. Note: I am only working with audio tape data, and so I do not have enough information about what happens during pauses to be able to interpret them.

Code as a Turn:

1. If a place holder is required by a speaker before that speaker can continue, then it counts as a turn. For example, when the student needs to know that the teacher is attending before the student is willing to continue talking, then the teacher's marker of attention counts as a turn.

2. Attempts to get the floor, even when they are disregarded by the other participant, count as a turn.

3. When one participant fills in words in anticipation of what the other participant will say, this counts as a turn.

4. When a speaker (usually the student) is asked to take a turn (usually with a teacher question) and the student does not answer the teacher question but fills in with a place holder like "uhmmm" this counts as a turn.

The teachers are trained to code shifts in topic of conversation in their data. They can reliably discern topic shifts, and their hierarchical arrangement. In coding topic shifts, coders attend to the following linguistic markers, which frequently cue the shifts:

1. Place holders--for example, the teacher "Okay," pauses, and uhms.

2. The introduction of new information (Halliday, 1967; Clark & Haviland, 1977).

3. A breakdown in chaining--a shift to a new set of cohesive devises, a new referencing pattern (Halliday & Hason, 1976; Hason, 1979)

4. Indirect speech acts--for example, student responses to teacher questions that act only as surface responses but that in fact provide a polite channel for the student to introduce a new topic (Searle, 1975).

For the oral taped data, the researcher and teacher participants worked together to devise a taxonomy of topics. The topic labels are derived from the data.

The coding procedure is illustrated below with a brief segment of discourse from the conference data.

[Init] T: Well what do you think you can do with this to turn it into a better rough draft? (1){dft}{rev}
..I mean a better final draft? (2)
...See thi..y..this is okay to use as your rough draft, (3)
S. Yeah. (4)
T. because you're getting all your ideas out. (5)
S. Yeah. (6)
T. ..Bu--t now what do you need to do with it? (7)

[Resp] S. ..I...guess I have to write..more on how...the advice..affected my life, (8){dft}{dev}{srv}
S. and not...you know why..it was bad advice. (9)
S. ...And not why I didn't like it. (10)
[Eval] T. Right. (11)
[Init] S. But I don't see how I'm gonna do with this topic. (12) {dft}{dev}{top}{srv}
S. Very well. (13)
S. ...That's the problem. (14)
[Resp] T. ..Okay, (15){dft}{dev}{top}{srv}
T. do you wanta...choose a different topic. (16)
S. Not really. (17)
S. I..I wanta, (18){dft}{dev}{top}{srv}
S. ...I wanta stick with this one, (19)
S. but I don't know what I should do. (20)
T. ...Okay, (21)
T. well one thing that we can think of doing..is ...tak..okay, (22)
T. where's your top..where's your thesis statement? (23) {dft}{dev}{top}{srv}{arg}

Note: Numbers in parenthesis after each line identify an idea unit. S indicates student talk. T indicates teacher talk. Two periods indicate a brief pause; three periods indicate a longer pause. The period at the end of the line indicates falling intonation, the comma rising intonation, and the question mark rising question intonation. The bracketed codes on the left of the transcribed talk show the IRE sequence. The bracketed codes at the right show the abbreviated topic labels. A complete list of topic codes and their meaning can be found in Appendix 1. The IRE sequences are only labelled for segments identified to receive more in-depth analysis.

In the transcribed text, the teacher initiates the topic of revising the paper with her "exam" questions and comments to the student in idea units 1-7; the student responds in 8-10. Student idea units 4 and 6 are backchannel cues, tracks for the conversation. Teacher idea unit 11 serves as evaluation and ends Mehan's IRE sequence. In idea unit 12 the student initiates a new IRE sequence on a new but related discourse topic. The student is unhappy with the essay topic and thus does not know how to revise. From 11 on, talk revolves around the essay topic. Although revision of a draft is still an underlying topic, the student has identified why she is having trouble revising and in 21 the teacher begins her response move to help the student tackle the problem. Thus, in this sequence, the main discourse topic is revision of a draft by developing the draft differently, with a subtopic about the essay topic initiated by the student and embedded within it and with the teacher bringing up the issue of the thesis, or the way the argument is framed. In the sample transcript, the topic shift occurs at both a turn and idea unit boundary; however, Freedman (1982) found that in writing conferences topics shift at idea unit boundaries but not

necessarily at turn boundaries.

In conferences topics of conversation, like Mehan's categories of structure, are arranged linearly and hierarchically, with one topic drifting into the next in a linear fashion (Sacks, 1971 cited in Coulthard, 1977) and with some topics forming subtopics of other more general topics in a hierarchical way (Freedman, 1981). This analysis is similar to that for the organization of written texts in hierarchies of propositions (e.g., Kintsch, 1974; Frederiksen, 1975; Meyer, 1975; van Dijk, 1980; de Beaugrande, 1980).

A computer program has been developed to facilitate the analysis of this conference data. The program counts all coded discourse topics, the number of idea units on each topic, who initiates each topic and how many times. It is also capable of quantifying speech habits that may be correlated with the smoothness of the conversational flow (e.g., number and types of backchannel cues). This computer analysis points to gross differences between the conferences of different teachers, across the different types of conferences, across the different types of students in the study. It also points to the focus of the discourse for each conference and allows the researcher to locate the focus for further analysis.

RESULTS

Results are included for the computer analysis of the conferences.

The topics of conversation (Appendix 1), were grouped into six clusters of related topics so that the analysis could be facilitated. Appendix 1 also lists the individual topics that fall under each of the following six headings for clusters of topics: logistics and procedures; general talk and talk about attitudes; oral language, reading, writing relationships; talk about text at the discourse level; talk about text at the level of syntax or mechanics; talk about cognitive processes. As the coding example on page 8 shows, frequently talk is about more than one topic at a time and therefore talk can be about more than one cluster of topics at a time as well.

The number of idea units for each conference was calculated first. Then the number of idea units on each cluster of topics within each conference was calculated. These calculations form the basis for a set of Kruksall Wallis non-parametric statistics which were run on all topic variables to determine whether teacher, type of student (gender, ethnicity, ability level), type of conference (introductory [conference 1], draft [conference 2], wrap-up [conference 3]) influenced the amount of idea unit focus by either the teacher, the student, or both. Tables containing the results of this analysis are appended (Appendix 2).

Across the four teachers in the study, the number of idea units was similar for the introductory and the wrap-up conferences; however, for the conference about a draft of an essay, the number of idea units for the entire conference varied depending on the teacher (see p. 1, Appendix 2).

On the cluster of topics dealing with logistics (pp. 2-5, Appendix 2) issues such as the time for the next conference and which papers need to be brought to class, teachers spend more focus with female students during the first conference. In the second conference, about a draft, female students spend more focus on logistics than male students do. In the first conference non-white students spend more focus on logistics than do white students. Talk about logistics does not vary according to the ability level of the student. Different teachers vary in their focus on logistics during the last, wrap up conference.

General talk and talk about attitudes did not vary across students, teachers, or the different types of conferences. This cluster of topics involved talk about students' jobs, personal issues, and attitudes toward schooling, the class and the like (pp. 6-9, Appendix 2).

The third topic, the connections between reading, oral language, and writing, involved discussions on issues such as talking about ideas before writing about them or using

professional writers as models for syntactic style (pp. 10-13, Appendix 2). In the conference about the draft, the teachers talked about these relationships more with the female than with the male students. In the third conference, the white students talked more about the connections across the discourse channels. There is no difference for students of different ability levels or across the teachers.

The fourth topic (pp. 14-17, Appendix 2) concerns talk about the more global properties of text--talk about getting ideas, developing ideas, organization and the like. Such talk was significantly greater by male students during the first conference, by white students and their teachers during the second conference about the draft. There were no differences with respect to ability level. Individual teachers showed a different stress on the higher level discourse properties during the first conference as did their students.

The fifth topic (pp. 18-21, Appendix 2) concerns talk about the less global properties of text--talk about spelling, punctuation, syntax and the like. These less global topics were stressed more by females than males in the third and final conference. During the second conference about the draft the non-white students spend more of their talk on these lower text features than the white students did. Some of these non-white students were non-native speakers of English. Again there were no differences across ability levels or across teachers.

The sixth cluster of topics (pp. 22-25, Appendix 2) covers issues dealing with the cognitive processes involved in the production of text--how one gets ideas, how to remember one's audience. Although gender differences did not matter for this variable, ethnicity did. In the last conference, the wrap-up, the white students and their teachers focused more here. Again ability proved insignificant. In the second conference, individual students within the classes of these teachers talked more about process than others.

The overall patterns across these variables show that ability level of the students never differentiates the focus of the talk. There are effects across gender and across ethnic group. For female students, either their teachers or they talk more about logistics and connections between discourse channels, and the more micro levels of the text. Males, on the other hand talk more about the macro levels of the discourse. For the ethnic groups, the non-white students talk more about logistics; the whites talk more about the macro levels of the discourse whereas the non-whites talk more about the micro levels. Also, there is more talk about cognitive processes with the whites than the non-whites and more talk about the connections between the discourse channels. Finally, there are differences across teachers only in the amount of focus on logistics and in how they differentiate talk about cognitive processes across students.

DISCUSSION

The analysis performed here is a first step in looking at a rich data source. Future analyses will involve closer looks at the second conference of the semester, the one about the draft of the student paper and one which is full of difference across ethnic and gender boundaries. Analyses of this conference will be connected to analyses of the students' writing.

Additionally, as often as not, students seem to direct the differences that occur in the conference conversations. The female and non-white students focus more of their talk on logistics and on the micro levels of the discourse; the male students focus more of their talk on the macro levels of the discourse. These teachers, on the whole, are very even in their differences in topic focus. They individualize on one variable, cognitive processes, and they do not individualize according to ability level, gender, or ethnicity; rather, it seems that they individualize according to student need. The teachers give different length conferences as measured by numbers of idea units only for the introductory and wrap up conferences. The length of the conference about the draft is stable across the teachers. Future analyses might examine how these teachers accomplish as much stability across students as they do.

This computerized topic coding allows the researcher to quickly find parallel moments across teachers and across different types of students. A more detailed linguistic analysis needs to be carried out on some of these parallel moments that will be particularly revealing with respect to how expert teachers accomplish successful conferences.

Appendix 3 contains a paper presented at the 1984 meeting of the American Educational Research Association that shows a more detailed analysis of parts of this data set, as well as a paper by one of the teacher-participants analyzing his own data.

I would like to thank the NCTE Research Foundation for its support of this project which has taken a lot longer than I expected it to take. I appreciate your patience in waiting for this final report. Although the project itself is complete, I feel that your support has allowed me to collect a data base that will be useful for years to come. I will be releasing the computer coded data to Carnegie-Mellon University's language archive data bank so that other researchers besides myself will have access to the data for future analyses.

Appendix 1

Topic Codes and Clusters of Topics

CODES

gin	general interview
tst	test
pap	paper
gwr	general writing
scn	student concerns
nam	name
fmt	format
crt	critique
sns	steps and stages
wrq	writing quantity
qst	questions or questionnaire
pwr	past writing
snw	strengths and weaknesses
cls	class
rdg	reading (of the paper) (check rdn)
fwr	writing feelings (about particular piece)
sqs	student questions
grv	general revisions
chg	change
prc	process (learning process)
arg	argument
dev	development
org	organization
sst	sentence structure
mec	mechanics
gpr	general process
pln	planning
trn	translating
srv	substantive revision
erv	editing revision
ppr	positive praise
npr	negative praise
psc	positive security
nsc	negative security
rdr	reader
log	logistics
tme	time
unc	uncodable
top	topic
tch	teacher
ton	tone
rhb	reading habits
awr	attitudes toward writing in general.
jnl	journal
grd	grade
inc	intros and conclusions
vcb	vocabulary
sty	style
tut	tutor
mde	mode of discourse
plg	plagiarism

dft	draft
cls	class
prd	past reading
fgn	general feelings
gng	greetings and goodbyes
mpb	medical problems
fut	future plans
irt	invitation to return
atd	general attitudes
str	student/teacher relationship
tlk	general conversation, personal, non-class
orw	oral/written
exc	extra curricular
res	research study
job	job or work
ocl	other classes
maj	major
cnf	conferences
rsp	response
prg	progress
acl	attitude to class
sty	style (syntactic finesse)
tvn	television
atd	attempted topic development
ati	attempted topic invitation

CLUSTERS OF TOPICS

Logistics

tst	test
fmt	format
log	logistics
tme	time
tut	tutor
cls	class

Attitudes and General Talk

scn	student concerns
nam	name
qst	questions or questionnaire
pwr	past writing
snw	strengths and weaknesses
cls	class
fwr	writing feelings (about particular piece)
sqs	student questions
ppr	positive praise
npr	negative praise
psc	positive security
nsc	negative security
tch	teacher
awr	attitudes toward writing in general.
jnl	journal
grd	grade
plg	plagiarism
fgn	general feelings
gng	greetings and goodbyes
mpb	medical problems
fut	future plans
irt	invitation to return
atd	general attitudes
str	student/teacher relationship
tlk	general conversation, personal, non-class
exc	extra curricular
res	research study
job	job or work
ocl	other classes
maj	major
cnf	conferences
rsp	response
prg	progress
acl	attitude to class
tvn	television

Reading, Oral Language Connections

rdg	reading (of the paper) (check rdn)
rdr	reader

rhb	reading habits
prd	past reading
orw	oral/written

Higher Discourse Text

arg	argument
dev	development
org	organization
top	topic
ton	tone
inc	intros and conclusions
mde	mode of discourse

Lower Discourse Text

wrq	writing quantity
sst	sentence structure
mec	mechanics
sty	style (syntactic finesse)
vcb	vocabulary

Higher Processes

gwr	general writing
crt	critique
sns	steps and stages
grv	general revisions
chg	change
prc	process (learning process)
gpr	general process
pln	planning
trn	translating
srv	substantive revision
erv	editing revision
dft	draft

Appendix 2

Tables: Analysis of Topic Clusters across Conferences

GROUPS: Teachers

VARIABLE	Logistics		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	*
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NS	*

GROUPS: Ability

VARIABLE	Logistics		
	CONFERENCE		
GROUP	1	2	3
STUDENTS	NS	NS	NS
TEACHERS	NS	NS	NS
COMBINED	NS	NS	NS

GROUPS: Race

VARIABLE	Logistics		
	CONFERENCE		
GROUP	1	2	3
STUDENTS	NW*	NS	NS
TEACHERS	NS	NS	NS
COMBINED	NS	NS	NS

GROUPS: Gender

VARIABLE	Logistics		
	CONFERENCE		
GROUP	1	2	3
STUDENTS	NS	F*	NS
TEACHERS	F*	NS	NS
COMBINED	NS	NS	NS

GROUPS: Teachers

VARIABLE	Attitude and General Talk		
	CONFERENCE		
	1	2	3
STUDENTS	NS	NS	NS
TEACHERS	NS	NS	NS
COMBINED	NS	NS	NS

GROUP

GROUPS: Ability

VARIABLE	Attitude and General Talk		
	CONFERENCE		
GROUP	1	2	3
STUDENTS	NS	NS	NS
TEACHERS	NS	NS	NS
COMBINED	NS	NS	NS

GROUPS: Race

VARIABLE	Attitude and General Talk		
	CONFERENCE		
GROUP	1	2	3
STUDENTS	NS	NS	NS
TEACHERS	NS	NS	NS
COMBINED	NS	NS	NS

GROUPS: Gender

VARIABLE	Attitude and General Talk		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	NS
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NS	NS

GROUPS: Teacher

VARIABLE	Reading-Oral Language Connection		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	NS
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NS	NS

GROUPS: Ability

VARIABLE	Reading-Oral Language Connection		
	CONFERENCE		
GROUP	1	2	3
STUDENTS	NS	NS	NS
TEACHERS	NS	NS	NS
COMBINED	NS	NS	NS

GROUPS: Race

VARIABLE	Reading-Oral Language Connection		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	W*
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NS	NS

GROUPS: Gender

VARIABLE	Reading-Oral Language Connection		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	NS
GROUP: TEACHERS	NS	F *	NS
GROUP: COMBINED	NS	NS	NS

GROUPS: Teachers

VARIABLE	Higher Discourse Text		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	*	NS	NS
GROUP: TEACHERS	*	NS	NS
GROUP: COMBINED	NS	NS	NS

GROUPS: Ability

VARIABLE	Higher Discourse Text		
	CONFERENCE		
GROUP	1	2	3
STUDENTS	NS	NS	NS
TEACHERS	NS	NS	NS
COMBINED	NS	NS	NS

GROUPS: Race

VARIABLE	Higher Discourse Text		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	W *	NS
GROUP: TEACHERS	NS	W *	NS
GROUP: COMBINED	NS	W *	NS

GROUPS: Gender

VARIABLE	Higher Discourse Text		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	M**	NS	NS
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	M**	NS	NS

GROUPS: Teacher

VARIABLE	Lower Text		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	NS
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NS	NS

GROUPS: Ability

VARIABLE	Lower Text		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	NS
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NS	NS

GROUPS: Race

VARIABLE	Lower Text		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NW*	NS
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NW*	NS

GROUPS: Gender

VARIABLE	Lower Text		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	F**
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NS	NS

GROUPS: Teacher

VARIABLE	Higher Processes		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	*	NS
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	*	NS

GROUPS: Ability

VARIABLE	Higher Processes		
	CONFERENCE		
GROUP	1	2	3
STUDENTS	NS	NS	NS
TEACHERS	NS	NS	NS
COMBINED	NS	NS	NS

GROUPS: Race

VARIABLE	Higher Processes		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	W *
GROUP: TEACHERS	NS	NS	W *
GROUP: COMBINED	NS	NS	W **

GROUPS: Gender

VARIABLE	Higher Processes		
	CONFERENCE		
	1	2	3
GROUP: STUDENTS	NS	NS	NS
GROUP: TEACHERS	NS	NS	NS
GROUP: COMBINED	NS	NS	NS

Appendix 3

Supplementary Papers Using Conference Data

Symposium: The Nature of Explicit Knowledge and the Role of Conscious Processing in Composing

"The Acquisition of Skill: Intuition and Conscious Knowledge During Instruction" [1]

Sarah W. Freedman
Cynthia Greenleaf
University of California, Berkeley

Paper presented at the annual meeting of the
American Educational Research Association
New Orleans, 1984

The Acquisition of Skill: Intuition and Conscious Knowledge During Instruction[1]

Sarah W. Freedman
Cynthia Greenleaf
University of California, Berkeley

Ga: I understand where my problems lie a little bit more than I did before, so I can watch out. And also I've never had levels of generality. It was interesting, and like I mentioned before, it helped me. It's helped me already in one of my other classes. I set my essay up the right way, and I guess it sounded good to the teacher.

T: That makes me feel really good. I'm real glad that you were able to apply it outside of your English class, 'cause really that's the object of the exercise, although many students don't realize that. They think "Oh, I'll just make it through my English class, then I won't have to worry about it again." But it's really good if you can carry it with you. So, in a sense, you do feel that you've managed to get something and walk away with it.

Ga: Oh yeah, definitely.[2]

Georgia, a college student, and her writing teacher part ways after a semester's instruction. The essays Georgia produced for this writing class show so much improvement that it is no wonder that Georgia is noticing the good effects in her writing for her other classes as well (compare the appended opening paragraphs of Georgia's first and last essay for the course). The question we pose here is: what is the role of explicit knowledge both in Georgia's skill development over the course of the semester and in her ability to "walk away with" or transfer her skills beyond her writing class?

As the impulse to put together this symposium indicates, controversy surrounds the study of skill development, particularly the role of explicit knowledge in that development.

Researchers in the domains of cognitive science argue about the extent to which knowledge is encoded in a consciously retrievable way, so that it can be communicated to an outside observer. Some theoristis even claim that true experts perform intuitively and are not calling on conscious knowledge at all (Dreyfus, 1984). In the last analysis, however, the role of explicit knowledge in skill development is only interesting as it helps us understand the utilizability of knowledge. What researchers and teachers alike are trying to accomplish is to get students to the point of being able to call up and use knowledge learned in the classroom, to have something to "walk away with," as Georgia seems to have. Ultimately, our practical definition of explicit knowledge explains explicit knowledge as the ability to use knowledge in novel situations to solve problems, the ability to bring known information and skills to bear at will. And metacognition is the ability to know what sorts of thinking strategies are likely to be effective in particular situations.

We will not discuss intuition here because although we admit that intuition most likely plays a role in skill development and performance, practically speaking, intuition is difficult to teach. Intuitive strategies, according to Dreyfus (1984) are at the heart of expert performance but are achieved only after one passes through the more explicit, problem solving stages. Our focus here is on the explicit, problem solving stages as we watch Georgia struggle to achieve competence in writing.

The question, for instruction, is this: How can we facilitate the acquisition of the willful use of knowledge in

problem solving? How can we provide not only knowledge and skills, but the ability to transfer these to new situations?

Research in the acquisition of cognitive skills suggests that one learns and is then able to transfer what one learns, by engaging in varied activities. When these activities are designed to foster the acquisition and use of problem solving strategies in a domain, they increase the generalizability of the problem solving strategies (Anderson, 1982; Gal'perin, 1969). For example, Hillocks (1984) finds that in teaching writing, such problem solving activities promote the acquisition of written language. From another point of view, research in teacher training suggests that when teachers self-consciously go through a process of using and reflecting on strategies for improving their writing, they are better able to provide instruction in these strategies (Carroll, 1984). One way to help encourage transfer, then, is through varied activities and through self-reflection on the process of using these skills.

Additionally, research on the transferability of skills to new situations suggests that the use of language to explicitly draw connections between contexts is important in knowledge transfer (Reed, Ernst, & Banerji, 1974, Gick & Holyoak, 1980). Ethnographic research in instructional settings, particularly classroom settings where much of the work of teaching is accomplished through classroom language, shows that a shared terminology arises for talking (and thinking) about strategies, skills, and contexts where they apply (Gumperz, 1983; Cazden, John, & Hymes, 1972). In two ways, through the construction of shared terminology and by explicitly making ties between

contexts, classroom language appears to serve not only to get across information and provide strategies for problem solving, but also to help organize these for use in contexts that may arise outside of the classroom.

Teachers can help to provide for the transfer of skills to new contexts, then, in at least two ways. They can provide activities that foster the use of these strategies and self-reflection on cognitive processes, and they can use language to help make the connections clear between activities inside and outside of the classroom. In examining Georgia's case, we concentrate on language because we feel that its importance is often ignored by teachers and researchers alike. In addition, explicit language use is a skill that is easily taught to teachers, and one that may make the difference between useful knowledge and isolated skills for a learner. We look, therefore, at the language of instruction that leads to Georgia's last remarks of the semester.

But before turning to Georgia's case, we will review relevant research on the transferability of knowledge. Such research typically is done using isomorphic problem sets. Subjects are trained to solve problems in one form, and are then given the logical analogue of the problem to solve. Results of these studies demonstrate that unless subjects are explicitly informed of the connection between these problems they will fail to transfer learned problem solving skills to the new setting (Reed, Ernst, & Banerji, 1974). Even when researchers are careful to supply all relevant analogous information, subjects do

not spontaneously apply this information to the new problem (Gick & Holyoak, 1980).

This research raises several problems for thinking about instructional settings. How can it help us explain failures to transfer learned skills to new, extremely similar contexts? Gick & Holyoak propose that skills and knowledge from disparate contexts of learning are encoded differently. The problem of connecting two bodies of information is thus one of overcoming "contextual barriers." The ability to detect analogies between contexts in order to spontaneously apply known skills seems to be a "relatively rare individual achievement" (Culture and Cognitive Development, 1982, p. 122). Georgia, then, to transfer her skills, must detect the analogies between writing contexts. We cannot expect her to detect these analogies spontaneously.

How, then, can past experience carry over to new situations? If all learning is not to be the acquisition of isolated skills, learners must be able to retrieve in new or future contexts the knowledge and processes that allow for skilled performance. Clearly, proficient behavior in daily life activities is proof enough that we bring past learning to bear on new situations. The authors of Culture and Cognitive Development suggest that such proficient behavior (implying transfer of knowledge) is "arranged by the social and cultural environment" through overlap in environments and the societal resources for pointing out areas of overlap (p. 124). According to these researchers, the most important of these resources is the language which encodes similarities between contexts.

The terminology which is used to refer to activities or

events in different settings reinforces the analogy between these activities and events, reinforces the perception of a sameness in them, regardless of the setting in which they take place. For Georgia, the term "levels of generality" applies across writing contexts.

Language, particularly as it labels activities, contexts, and events, seems to be a code that moves the individual learner away from a dependency on features of a particular context. "When language encodes the relevant relation between distinct contexts, the contexts are no longer distinct; no transfer as an individual invention is required" (Culture and Cognitive Development, p. 126). If language supports recognition of context similarity in cultural domains, then we can assume it functions similarly in the classroom. Furthermore, we can use language self-consciously to point out similarities between classroom activities, the past experiences of learners, and probable future settings that require the problem solving skills we are in the process of teaching. Indeed, the research on problem transfer in isomorphic situations implies that we must do so in order to promote successful use of classroom learning outside of the classroom.

We shall now turn to Georgia's first meetings with her teacher during the semester to try to understand how Georgia's terminology for writing becomes a full code. When Georgia entered the class, she was concerned with her weaknesses in spelling, proofreading, and vocabulary (a euphemism for her ability to find the words she wants when she writes). In her first conference

with her teacher, Georgia spends more time talking about mechanics than any other topic (47%). The teacher helps Georgia put her concerns in perspective. The teacher says explicitly,

> Although I do think that spelling is important, I don't think that it's the most important thing in terms of writing. And I think that maybe if we made an agreement to not allow your spelling to intertere with the way I judge your papers, that will free you to just write. I'd like you to concentrate on other parts of writing. I'd like you to concentrate on the kinds of things that we've been talking about. Is my topic sentence a good topic sentence? Does it predict? Is it well-focused? And when we start getting into locus of generality, and development and organization, those are the kinds of things that I really really really want you to concentrate on.

The teacher hierarchicalizes the term "locus of generality" here. She lets Georgia know that it fits into a category of other "important" terms, and not into a category with spelling which is not so "important." The teacher forces the student to recognize the hierarchy by changing the incentive systems for the class; Georgia will get no credit for working on her spelling. Thus Georgia first learns that she must come to understand the full meaning of "locus of generality" as well as its accompanying terms of "topic sentence," development," and "organization." Additionally, the teacher, in her explicit language, is emphatic that Georgia should concentrate on the higher discourse levels. She repeats "concentrate on" three times in a short stretch of talk and adds the intensifier "really, really, really." It would be difficult for Georgia to miss her teacher's point.

Georgia next reveals her incomplete understanding of "generality." The teacher asks Georgia if she knows when to paragraph. Georgia replies:

Oh yeah. Right. It should have one

paragraph stating what the topic sentence said. Now, my problem is, that's fine. I can get it all to agree with the topic sentence, but the topic sentence that I see myself writing--sometimes I think I'll run-on, or you know there in order to get specific, but not still be general. I have a run-on sentence. Or maybe my choice of wording, wordage is redundant?

The teacher immediately notices that Georgia is confused about what constitutes generality and specificity. She again uses explicit language to help Georgia build her understanding:

> Now we're dealing with a couple of different concepts here. Lets keep a list of these words that you just mentioned. You mentioned run-on. You mentioned general and specific. And you mentioned redundant. All four of those things have nothing to do with each other. So I think maybe what we ought to do is clear up, your idea of what each of these things are. Okay? The easiest one to deal with, I think, to begin with, is the word redundant. What is redundant?

As Georgia attempts to answer the teacher's questions, she reveals her understanding of redundancy which limits the concept to the word level:

> Well, to give you an example here. Say using the same words for description. Maybe that's a just a problem of, like I said, a choice, or a little bit more of a boost to my vocabulary. Like checking out the the synonyms and antonyms for words which I had some background in. In this topic sentence I said, "Garden plants can be hazardous." And, "You should be cautious of the hazards, before entering your garden." You know I'm saying hazardous, and hazards."

Redundancy means lack of variety in word choice to Georgia.

The teacher interrupts to help Georgia construct a fuller understanding. She is explicit as she tells Georgia that Georgia understands redundancy to be an issue of style while the teacher wants her to broaden and change somewhat her sense of this technical term from the level of the word to the level of the idea. The teacher says:

> Ok, now here again, that's not really redundant.

That's using the same word twice, and that in my opinion, has to do with style. Somebody chooses a style, and some people feel that, in order to have a good style you can't use the same word twice, so you say that "Plants can be hazardous, and so you have to be really careful to avoid the dangers." Okay? That has to do with word choice. Redundant, on the other hand, is when when you're repeating, not the same word, but the same idea.

The teacher continues by connecting the concept of redundant to general and specific, again perfectly explicitly.

And in a sense, Georgia I think general, specific, and redundant, really are connected, in that, let's suppose you have a general statement. If your next sentence is a more specific example of that general statement, then you're on the right track. If you have a general statement and your next sentence thinks it's being more specific, but in fact, is saying the exact same thing, in the exact same, general way, that your general statement did, that's being redundant. It's not using the same words. In fact, it's using different words, thinking that you're getting more specific, when in fact, those different words, are saying, the exact same thing that our first sentence said. So an example of redundancy, if I can make one up off the top of my head would be something like, "I really loved my English 114 class." Period. "I got a lot out of my English 114 class." Period. "I never learned more in any other class than my English 114 class." Notice that they are three very separate sentences, but that there's no development. Those ideas are all saying basically the same thing. But a student might say to himself, "I really loved--" Love. That's general. "Got a lot out of." That's more specific. "Never got more out of." That's even more specific. But it's general. When in fact, it's not more specific.

Georgia says simply, "I understand." Then she immediately indicates that she is transferring this understanding to another context, her writing from the previous semester. She continues,

I think I'll bring in my essay from my BSS class last semester and that is where I think I had a lot of redundancy in my paragraphs. I would start on the topic of culture, and how culture relates to values and I'd probably have my statement in another statement that is just as general. Maybe that's why I got such a bad grade on it.

The teacher, wanting to insure the transfer, reiterates:

> Right. See what happens is, we think, I do that too, when I'm writing. You know, when I first start writing, I think, that I'm developing one idea. And then I realize that every one of my sentences are really saying the same exact thing only I'm using different words. That's being redundant. Okay. And that, as you can see is tied up with general and specific. Remember general is just a general statement. Specific means specific examples, or facts, or descriptions, or details that demonstrate that general statement. That's development. Okay? The other thing is run togethers that we talked about. And and that is totally different. That's a grammatical problem. And that has to do with where you put your period. Or don't put your period, more specifically.

Again the teacher separates out the discourse level issues of redundancy, development and specificity from issues she considers "grammatical" or "mechanical."

Ethnographic research in schools shows that students and teachers actively construct shared meanings over time through their interactions over instructional activities. Part of this construction is a language or terminology for talking about those activities. Vygotsky (1978) has suggested that learners internalize socially constructed meanings and the labels given to social activities. These internalized understandings come to guide the behavior of the learner. In this way, the student is able to move from a point in the development of a skill when she can only perform skillfully with the help of others (Vygotsky's zone of proximal development) to a point where she can independently solve problems. We see Georgia give evidence of her growing understanding, an understanding which seems related to her teacher's explicit explanations.

Following Vygotsky's theory of internalization, Gal'perin (1969) has conducted longitudinal studies of skill development,

in part focusing on the role of language use in this development. He notes that whole activities in instructional domains very quickly come to be designated by a technical (domain-specific) terminology. Teachers and students alike use simple linguistic labels to refer to complex activities. Just as Georgia comes to build a complex representation of movement between the general and specific, in one ninth grade classroom where we are studying the acquisition of expository writing, verbal labels such as "finding a focus" come to designate various complex learning activities which are carried out in different settings and with different materials. The use of this label helps to point the learners to similarities in these diverse learning situations. "Finding a focus" comes to stand for a variety of activities that these students experience over the semester in their writing class.

We are not making a claim here that knowledge itself is encoded semantically. We are following the work of the authors of Culture and Cognitive Development in suggesting that language use, in particular the technical domain-specific language constructed in classrooms, marks similarities in contexts for the learner. In instructional practice, contexts that are similar are precisely those that require similar problem solving strategies and call up the same bodies of relevant information.

Flower and Hayes (1984) present evidence from their studies of writing that suggests that knowledge is encoded in a variety of ways. It seems plausible that some aspects of experience in learning activities may be represented imagistically, and that explicit procedural instructions and formulas may be encoded

differently from these more holistic experiential representations. In the classroom, technical terminology comes to stand for whole systems of complex problem solving strategies and procedures. It may be that these labels mark as related all of the myriad cognitive representations associated with these learning situations.

Socially constructed terminology for designating activities would then serve as an index to related sources of knowledge stored in diverse ways. Transfer would be facilitated precisely because a search for relevant knowledge to bring to bear on a problem would call up all of these marked sources at once. This hypothesis suggests to us that skill acquisition is more than the acquisition of information and procedures or strategies for dealing with that information. It may also very well involve the establishment of knowledge networks that can be retrieved when needed.

We can suggest, at present, two related ways to test the hypothesis that explicit terminology serves as an index and an aid to organizing knowledge. Through ethnographic study, terminology that is active in a classroom could be isolated, and a semantic frame test (Agar, 1980) involving the labels in use could be employed to determine how events, activities, and strategies are understood by students. An analysis of the frame test might reveal the way knowledge networks are organized for retrieval by these students. A second possible test might be to purposefully create a learning situation, whereby students learn new concepts using new terminology. The development and

application of these concepts and terms could be followed closely to see if and how students understand and apply them.

If it is true that language helps to index knowledge that is represented in multiple forms, then by drawing explicit ties between activities and contexts teachers may be creating a rich, interconnected network of different types of knowledge that the learner can call up at once. This may be an explanation of how explicit language provides for transfer. In any case, we know from research on transfer of problem solving skills for isomorphic problems that it is necessary to explicitly draw the connections between contexts with language. By broadening those connections to include the past experience of learners and the probable concurrent and future arenas where skills learned in the classroom are applicable, the teacher has increased the likelihood that the students will "walk away" from the instructional setting carrying some useful knowledge.

Notes

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[2] For ease of reading, all transcripts have been edited to delete speech hesitations but to maintain the original syntax and meaning. Verbatim transcripts are available upon request.

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Appendix

Opening of Essay I

The worst type of work that one could choose to do is answering telephones for a popular pizza restaurant. Since I have had the ill-fated experience I know the strain of pressure that it provides. An operator's duties include answering numerous phone lines to receive pick-up or delivery orders and filling in other service areas when the phones aren't busy. This type of work is the worst type I know of because it exposes the worker to irate customers and a hectic working atmosphere.

Complaining customers are an everyday occurance, in a restaraunt, of whom I have classified into two types. The first type is the hot tempered, chronically disappointed patron who is dining at the restaraunt. He always finds something wrong with his food or table service.

Last Essay

Teenagers get a lot of advice from their peers. Some teenagers choose to accept this advice as correct; I did. When I was fourteen, my friend and I would frequent the local park. It was there that my friend, Rose, suggested we smoke cigarettes. She advised, "Smoking cigarettes will impress the guys, and help us fit in with the crowd." Since Rose had a sample pack of cigarettes in her purse, I decided to give it a try. Soon, I was smoking half a pack a day and she stopped smoking! I believe that Rose's advice was the worst advice I chose to accept because I was mislead to believe that smoking created popularity with men and enhanced one's social life, two feats which it cannot

perform.

I have learned that most men don't like women who smoke because women smokers smell like stale smoke, taste bad, and look terrible with cigarettes dangling from their fingers. A man likes to get close to a woman in a passionate embrace in which he is enticed by her perfume to continue advances. But when a woman smells of smoke, a man tends to back away from her....